

Micro Systems

Site Preparation Guide

This guide describes the physical, environmental, and electrical requirements that should be verified before installing systems that use the BA23, BA123, and H9642 enclosures. This guide covers MicroVAX II, MicroPDP-11, VAXstation II and VAXstation II/GPX.

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Introduction

This guide describes the physical, environmental, and electrical requirements that should be verified before installing the micro systems shown in Table 1.

Table 1: Micro Systems Covered by this Guide

System	Enclosures
MicroPDP-11	BA23, BA123, H9642
MicroVAX II	BA23, BA123, H9642
VAXstation II	BA23, BA123
VAXstation II/GPX	BA23, BA123, H9642

The BA23 and BA123 enclosures are designed for use in open office environments. The BA23 enclosure can be used in a pedestal or a tabletop configuration. The BA123 is a floorstand enclosure.

The H9642 cabinet is designed for use in computer rooms rather than office environments.

Before bringing systems into their final locations, it is important to verify that the conditions described in this guide are met.

The three factors involved in proper site preparation are physical, environmental, and electrical requirements. These are explained in the following pages.

Digital recommends that installation of your system be performed by a Digital Field Service Engineer. Digital also recommends that when the shipment arrives, you inspect it with a Digital Field Service Engineer to ensure that the system and all ordered options have arrived undamaged.

Each micro system is shipped in one large box that is clearly labeled. Other boxes that arrive with your shipment may contain terminals, printers, and software.

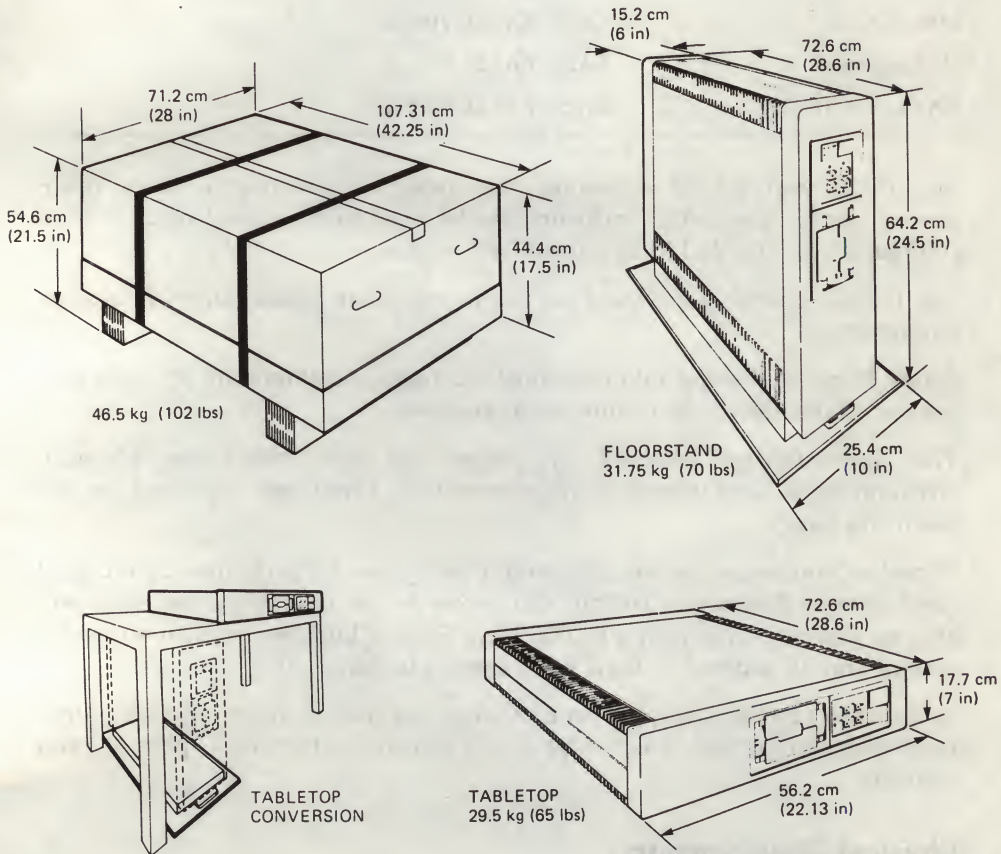
Physical Requirements

Before unpacking any system, use the following sections to determine your system's dimensions. Be sure that there is enough room in the area where the system is to be unpacked to remove it from its shipping container.

System Dimensions for the BA23 Enclosure

The following figure shows the dimensions of a micro system in the BA23 enclosure.

CAUTION: Due to the weight of the equipment, Digital recommends that at least two people handle the system and terminal boxes.

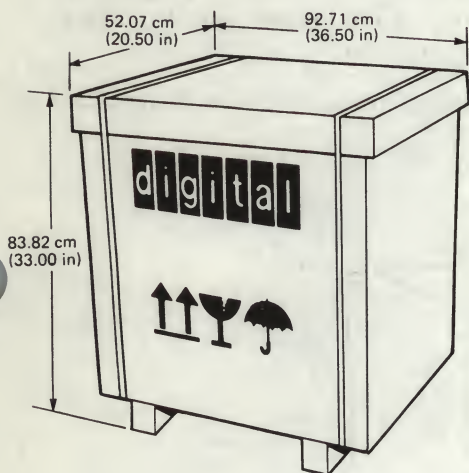


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System Dimensions for the BA123 Enclosure

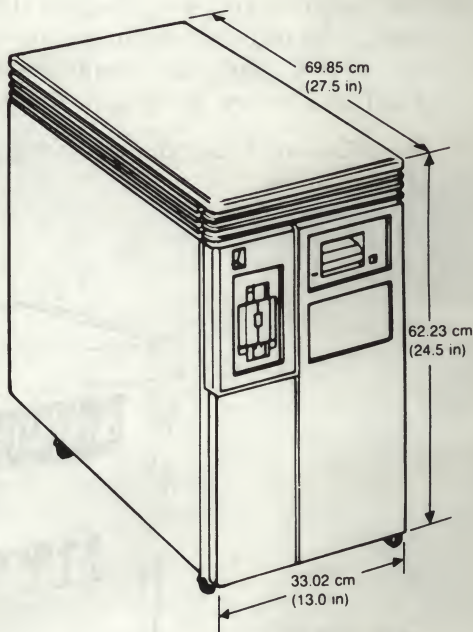
The following figure shows the dimensions of a micro system in the BA123 enclosure.

CAUTION: Due to the weight of the equipment, Digital recommends that at least two people handle the system and terminal boxes.



WEIGHT: 79.99 kg (220 lbs)

MR 17190



WEIGHT 59 kg (130 lbs)

MR 17189

System Dimensions for the H9642 Cabinet

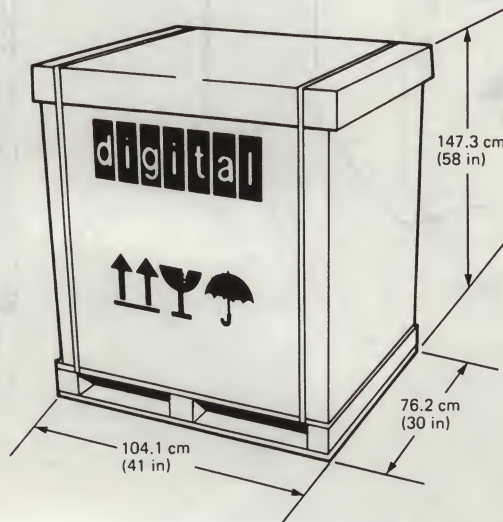
Systems that use the H9642 cabinet are shipped in large containers secured to wooden pallets by four metal hold-down brackets. Other containers arriving with your shipment may contain terminals, printers, software, and other options.

WARNING: A forklift is required to move this system and some options (those mounted on pallets). Do not try to move or lift this equipment by yourself.

The cabinet is mounted on four wheels and has four adjustable leveling feet for stability.

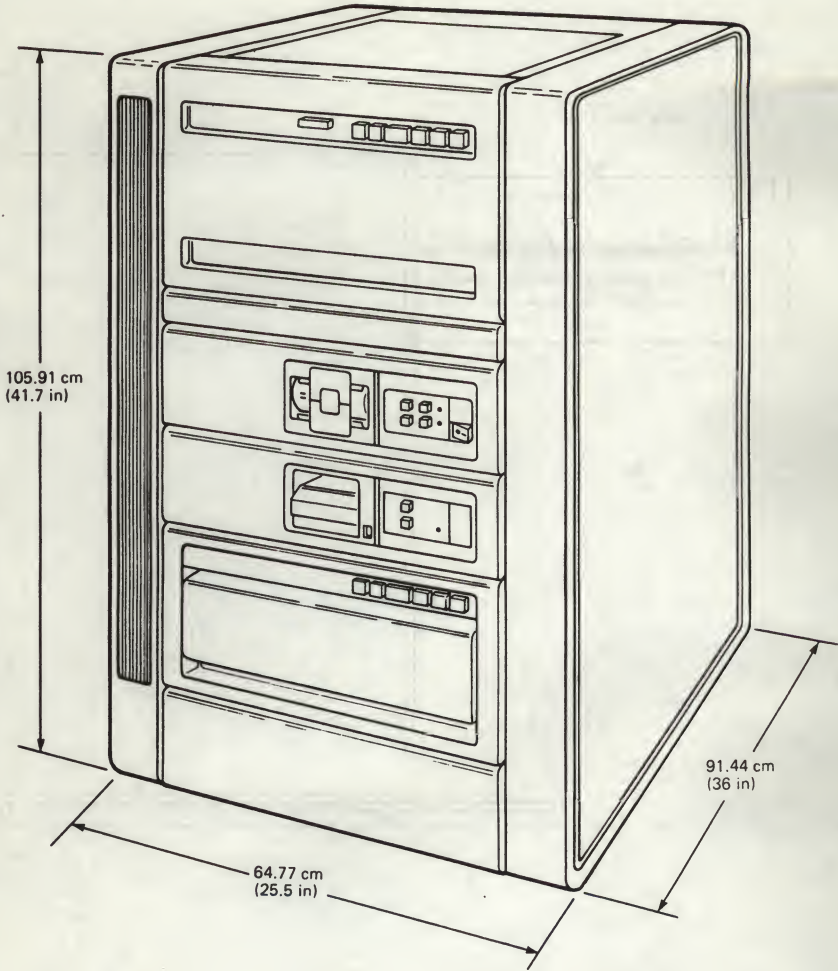
The weight of systems using the H9642 cabinet varies from 168 kg to 311 kg (358 lbs to 685 lbs), depending on the mass storage subsystems contained in the cabinet. Plan your installation accordingly. Fully loaded with RA60 and RA81 disk drives, the system weighs 311 kg (685 lb).

The following figure shows the shipping dimensions of a micro system in the H9642 cabinet.



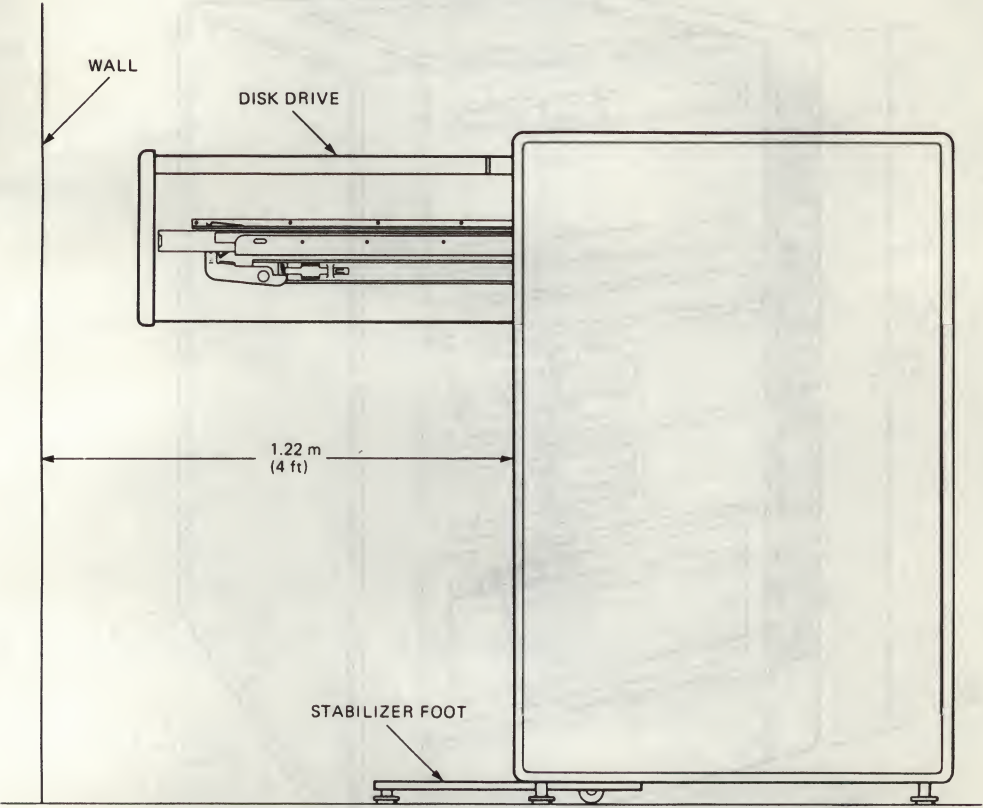
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The following figure shows the dimensions of an unpacked micro system in the H9642 cabinet.



MR 17194

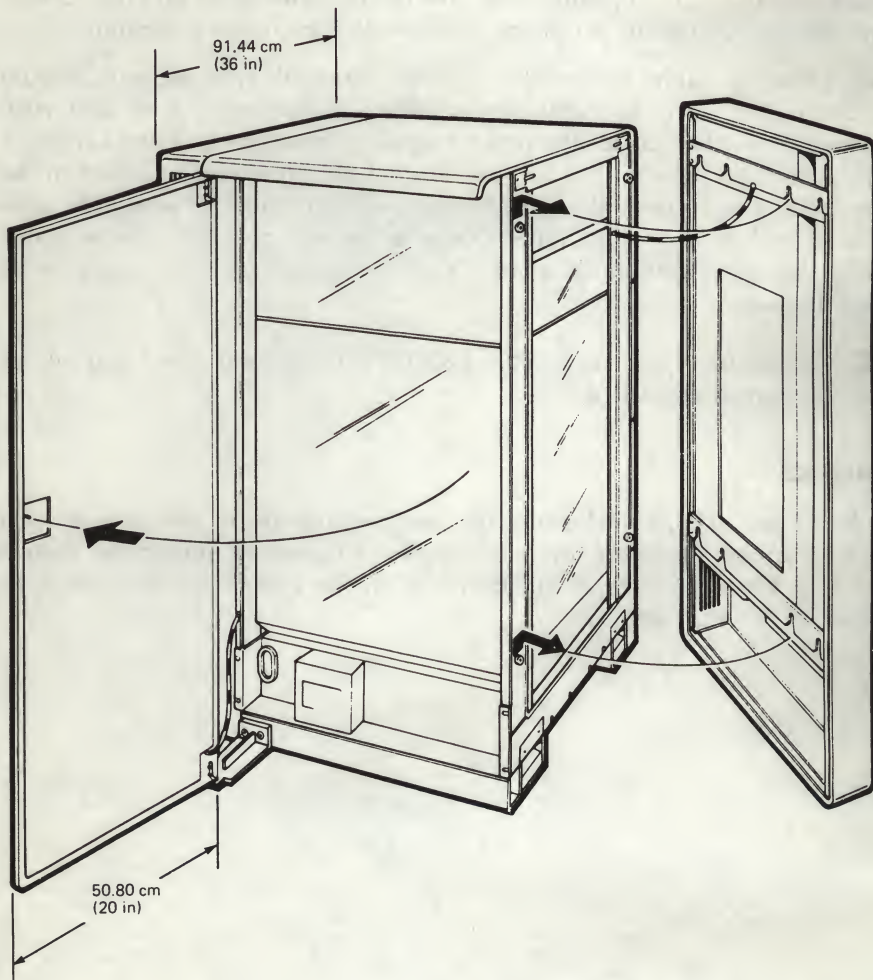
Leave a minimum of 1.2 m (4 feet) from the front of the system to the nearest stationary object so that the disk drives can be extended. The drives are approximately 86.5 cm (33.75 in) deep.



MR-17192

Leave a minimum of 1.2 m (4 feet) from the rear of the system to the nearest stationary object so that the rear door can be opened or removed. The rear door is approximately 51.3 cm (20.0 in) wide.

Leave space on each side of the system to remove the side panels.



MR 17193

Additional Equipment

In addition to space required for installation of the micro system, you should make sure there is sufficient space for terminals, a printer, mass storage media, printer paper, and other necessary supplies. The temperature and humidity at which mass storage media are kept should be the same as that of the computer area.

If you are planning to connect your system to peripheral devices such as printers, terminals, or modems, you will require additional cabling. Cables connecting the system to peripheral devices must be ordered separately.

When planning cable routing for multiple-terminal systems, you should consider factors such as safety, convenience, future expansion, and cost. The system installer must also make special considerations when cabling a multiple-terminal system that will be installed on more than one floor in the same building, or in more than one building. Digital offers several cable types for these applications, and Digital Customer Service personnel are available to help you plan your installation. Your sales representative can provide more information.

NOTE: *Cabling from peripheral devices should already be in place and labeled before the system is installed.*

Acoustics

The BA23 and BA123 enclosures are designed for use in offices and other populated areas. However, the H9642 cabinet generates more noise than is acceptable for office use. A micro system in the H9642 cabinet should be installed in a computer room.

Table 2: Operating Acoustic Emission Levels

Enclosure	LNPE (bels)	LPA (dB)
BA23	6.1	48
BA123	6.0	46
H9642 with no RA drives	6.0	45
H9642 with RA60 and RA81	7.6	64

LNPE = Noise power emission level (A-weighted sound power level) measured in bels re 1 pw.

LPA = Sound pressure measured in decibels at 1.0 m from the front edge of the unit and 1.5 m above the floor.

Operating Environment

Computer systems located in office areas are subject to discharge of static electricity, temperature changes, and humidity. These conditions can affect the operation and overall dependability of the computer system.

Your system should be installed in a well ventilated area in which the temperature and humidity ranges listed for your system are maintained throughout the year. Rapid temperature changes may affect system performance. Therefore, do not operate systems near heating or cooling devices, large windows, or doors that open to the outside. Air should contain a minimum of dust and other abrasive contaminants.

Static Electricity

Static electricity is a common problem for microcomputer systems. It can cause system failure and loss of data. The most common source of static buildup is contact between people and carpeting or clothing. Low humidity allows the greatest buildup of static charges.

To minimize static buildup follow these guidelines:

- Maintain relative humidity of at least 40%.
- Plan to locate your system away from busy office corridors.
- If possible, avoid using carpeting in the computer area. If carpeting is to be installed, use antistatic carpeting. If carpeting is already in place, place an antistatic mat under the system.

- If your site has antistatic floors, carpeting or mats, follow the manufacturer's recommendations for cleaning to maintain their antistatic properties.

Heat Dissipation

The following table lists the values for heat dissipated by each of the three micro system enclosures.

Table 3: Heat Dissipation

Enclosure	Heat Dissipation (BTU/k)
BA23	1177.4
BA123	2355
H7642	5872

Temperature and Humidity Ranges

Tables 4, 5, and 6 show the temperature and humidity ranges for micro systems in the BA23 enclosure. Altitude limits are listed following each table.

Table 4: Temperature and Humidity Ranges for MicroPDP-11 Systems in the BA23 Enclosure

Parameter	Range
Temperature (operating) ¹	15°C to 32°C 59°F to 90°F
Temperature (nonoperating)	-40°C to 60°C -40°F to 140°F
Temperature rate of change (operating)	20°C per hour maximum 36°F per hour maximum
Relative humidity (operating)	20% to 80% (noncondensing)
Relative humidity (nonoperating)	10% to 95%

¹For operation above 2.4 km, decrease the operating temperature by 1°C (1.8°F) per 1000 meters (3250 ft).

Altitude limits for MicroPDP-11 systems in the BA23 enclosure are as follows.

Operating: 2440 m (8000 ft)

Nonoperating: 9100 m (30,000 ft)

Table 5: Temperature and Humidity Ranges for MicroVAX II Systems in the BA23 Enclosure

Parameter	Range
Temperature (operating) ¹	10°C to 32°C 50°F to 90°F
Temperature (nonoperating)	-40°C to 66°C -40°F to 151°F
Temperature rate of change (operating)	11°C per hour maximum 20°F per hour maximum
Relative humidity (operating)	20% to 80% (noncondensing)
Relative humidity (nonoperating)	10% to 95%

¹For operation above 2.4 km, decrease the operating temperature by 1°C (1.8°F) per 1000 meters (3250 ft).

Table 6: Temperature and Humidity Ranges for VAXstation II and VAXstation II/GPX Systems in the BA23 Enclosure

Parameter	Range
Temperature (operating) ¹	15°C to 32°C 59°F to 90°F
Temperature (nonoperating)	-40°C to 60°C -40°F to 140°F
Temperature rate of change (operating)	11°C per hour maximum 20°F per hour maximum
Relative humidity (operating)	20% to 80% (noncondensing)
Relative humidity (nonoperating)	10% to 95%

¹For operation above 2.4 km, decrease the operating temperature by 1°C (1.8°F) per 1000 meters (3250 ft).

Altitude limits for MicroVAX II, VAXstation II, and VAXstation II/GPX systems in the BA23 enclosure are as follows.

Operating: 2440 m (8000 ft)

Nonoperating: 4900 m (16,000 ft)

Tables 7, 8, and 9 show the temperature and humidity ranges for micro systems in the BA123 enclosure. Altitude limits are listed following each table.

Table 7: Temperature and Humidity Ranges for MicroPDP-11 Systems in the BA123 Enclosure

Parameter	Range
Temperature (operating) ¹	15°C to 32°C 59°F to 90°F
Temperature (nonoperating)	-40°C to 60°C -40°F to 140°F
Temperature rate of change (operating)	20°C per hour maximum 36°F per hour maximum
Relative humidity (operating)	20% to 80% (noncondensing)
Relative humidity (nonoperating)	10% to 95%

¹For operation above 2.4 km, decrease the operating temperature by 1°C (1.8°F) per 1000 meters (3250 ft).

Altitude limits for MicroPDP-11 systems in the BA123 enclosure are as follows.

Operating: 2440 m (8000 ft)

Nonoperating: 9100 m (30,000 ft)

Table 8: Temperature and Humidity Ranges for MicroVAX II Systems in the BA123 Enclosure

Parameter	Range
Temperature (operating) ¹	10°C to 32°C 50°F to 90°F
Temperature (nonoperating)	-40°C to 66°C -40°F to 151°F
Temperature rate of change (operating)	11°C per hour maximum 20°F per hour maximum
Relative humidity (operating)	20% to 80% (noncondensing)
Relative humidity (nonoperating)	10% to 95%

¹For operation above 2.4 km, decrease the operating temperature by 1°C (1.8°F) per 1000 meters.

Table 9: Temperature and Humidity Ranges for VAXstation II and VAXstation II/GPX Systems in the BA123 Enclosure

Parameter	Range
Temperature (operating) ¹	15°C to 32°C 59°F to 90°F
Temperature (nonoperating)	-40°C to 60°C -40°F to 140°F
Temperature rate of change (operating)	11°C per hour maximum 20°F per hour maximum
Relative humidity (operating)	20% to 80% (noncondensing)
Relative humidity (nonoperating)	10% to 95%

¹For operation above 2.4 km, decrease the operating temperature by 1°C (1.8°F) per 1000 meters (3250 ft).

Altitude limits for MicroVAX II, VAXstation II, and VAXstation II/GPX systems in the BA123 enclosure are as follows.

Operating: 2440 m (8000 ft)

Nonoperating: 4900 m (16,000 ft)

Tables 10 and 11 show the temperature and humidity ranges for micro systems in the H9642 cabinet. Altitude limits are listed following each table.

Table 10: Temperature and Humidity Ranges for MicroPDP-11 Systems in the H9642 Enclosure

Parameter	Range
Temperature (operating) ¹	15°C to 32°C 59°F to 90°F
Temperature (nonoperating)	-40°C to 66°C -40°F to 151°F
Temperature rate of change (operating)	20°C per hour maximum 36°F
Relative humidity (operating)	20% to 80% (noncondensing)
Relative humidity (nonoperating)	10% to 95%

¹For operation above 2.4 km, decrease the operating temperature by 1°C (1.8°F) per 1000 meters (3250 ft).

Altitude limits for MicroPDP-11 systems in the H9642 enclosure are as follows.

Operating: 2440 m (8000 ft)

Nonoperating: 4900 m (16000 ft)

Table 11: Temperature and Humidity Ranges for MicroVAX II and VAXstation II/GPX Systems in the H9642 Enclosure

Parameter	Range
Temperature (operating) ¹	10°C to 40°C 50°F to 104°F
Temperature (nonoperating)	-40°C to 60°C -40°F to 140°F
Temperature rate of change (operating)	11°C per hour maximum 20°F per hour maximum
Relative humidity (operating)	20% to 80% (noncondensing)
Relative humidity (nonoperating)	10% to 95%

¹For operation above 2.4 km, decrease the operating temperature by 1°C (1.8°F) per 1000 meters (3250 ft).

Altitude limits for MicroVAX II and VAXstation II/GPX systems in the H9642 enclosure are as follows.

Operating: 2440 m (8000 ft)

Nonoperating: 4900 m (16000 ft)

Electrical Requirements

The power source should be adequate to handle the original system and allow for system expansion. Digital recommends a dedicated circuit from the power source to each micro system. A dedicated circuit provides electrical isolation from possible power surges or electrical noise caused by other appliances. For this reason, appliances such as air conditioners, office copiers, or coffee pots should not be connected to the same circuit as the micro system. This dedicated circuit should provide an isolated ground path between the micro system and the power source.

If you cannot avoid power disturbances, additional power-conditioning equipment is required. Your Digital sales representative can provide additional information.

Electrical Requirements for Systems in the BA23 and BA123 Enclosures

Table 12 provides power cord information for 240 V operation of systems in the BA23 and BA123 enclosures.

Table 12: Power Cords for 240 V Operation of Systems in the BA23 and BA123 Enclosures

Power Cord Number	Countries
BN02A-2E	UK and Ireland
BN03A-2E	Austria, Belgium, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Spain, and Sweden
BN04A-2E	Switzerland
BN05A-2E	Australia and New Zealand
BN06A-2E	Denmark
BN07A-2E	Italy

For additional information on 240 V operation of systems in the BA23 and BA123 enclosures, check with your sales representative.

Table 13 provides electrical requirements for systems in the BA23 enclosure.

Table 13: Electrical Requirements for Systems in the BA23 Enclosure

	120 Vac	240 Vac
Voltage Tolerance	88 to 128 Vac	176 to 256 Vac
Power source phasing	Single	Single
Frequency	60 Hz	50 Hz
Line frequency tolerance	47-63 Hz	47-63 Hz
Steady state current (typical)	4.4 A	2.2 A
Steady state current (maximum)	6.0 A	3.0 A
Power consumption (maximum)	345 W	345 W

Table 14 provides electrical requirements for systems in the BA123 enclosure.

Table 14: Electrical Requirements for Systems in the BA123 Enclosure

	120 Vac	240 Vac
Voltage tolerance	88 to 128 Vac	176 to 256 Vac
Power source phasing	Single	Single
Frequency	60 Hz	50 Hz
Line frequency tolerance	47 to 63 Hz	47 to 63 Hz
Steady state current (typical)	8.8 A	4.4 A
Steady state current (maximum)	12.0 A	6.0 A
Power consumption (maximum)	690 W	690 W

Electrical Requirements for Systems in the H9642 Cabinet

Systems in the H9642 enclosure must use a NEMA L5-30R (rated at 30 Amps) ac electrical receptacle for 120 V operation.

Most systems in the H9642 enclosure do not use the NEMA connector for 240 V operation. Those 240 V systems that do use the NEMA connector operate on 60 Hz. Contact your sales representative for information on any restrictions that may apply to 240 V, 60 Hz systems.

Table 15 lists power cords for 240 V operation for systems in the H9642 cabinet.

Table 15: Power Cords for 240 V Operation of Systems Using the H9642 Cabinet

Power Cord Number	Country	Service
BN18B-4E	UK and Ireland	240 V
BN18C-4E	Austria, Belgium, Finland, Netherlands, Norway, Portugal, Spain, and Sweden	220 V
BN18D-4E	Australia and New Zealand	240 V or 230 V
BN18E-4E	Italy and Switzerland	220 V
BN18F-4E	Israel	230 V
BN18H-4E	India	220 V
BN18J-1K	US	240 V
BN18K-1K	Japan	100 V or 200 V

Tables 16 and 17 show the electrical requirements for fully-configured systems in the H9642 cabinet.

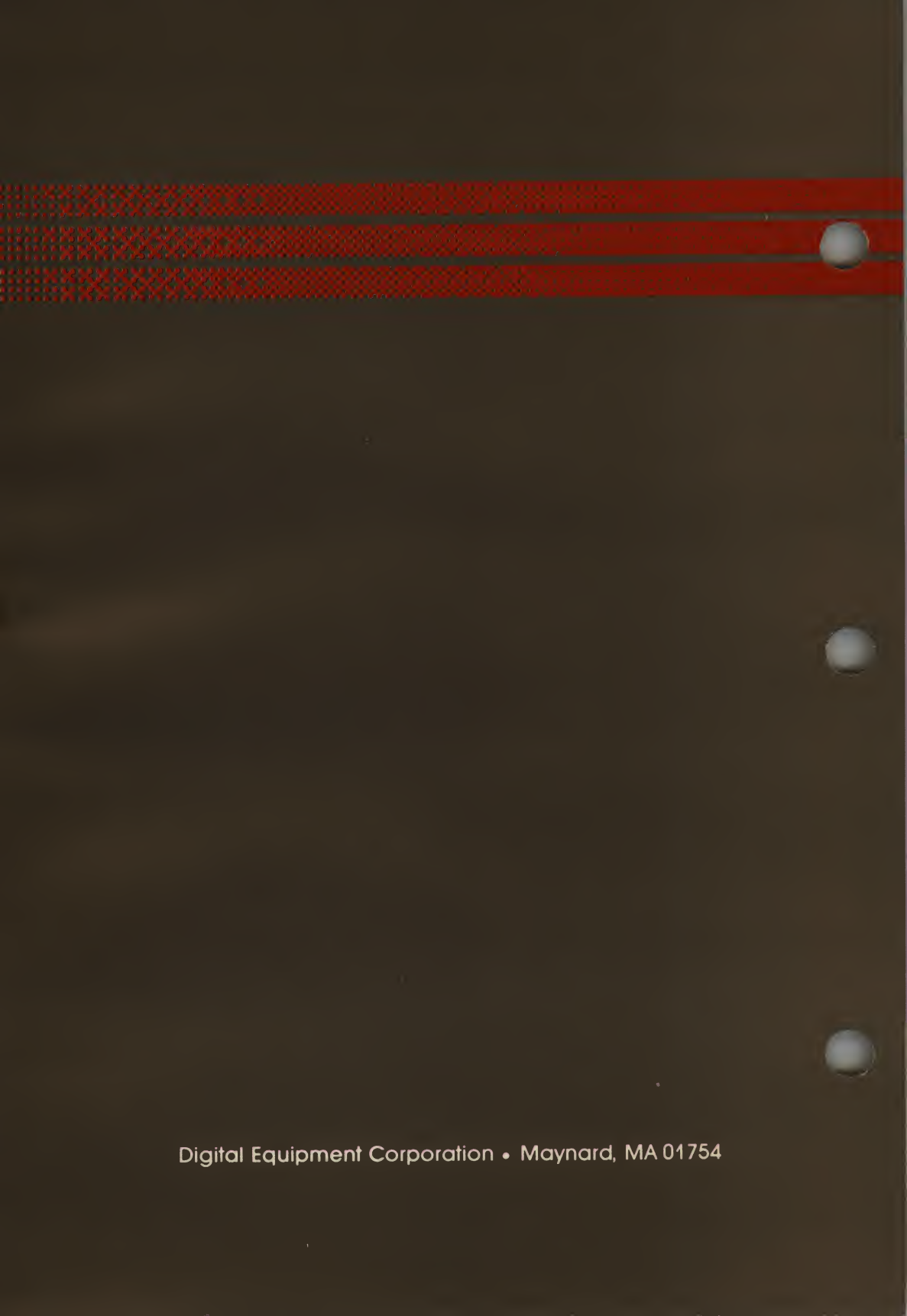
Maximum current and power values represent systems with two RA81 disk drives installed.

Table 16: Electrical Requirements for MicroPDP-11 Systems in the H9642 Cabinet

	120 Vac	240 Vac
Voltage tolerance	93 to 132 Vac	186 to 264 Vac
Power source phasing	Single	Single
Frequency	60 Hz	50 Hz
Line frequency tolerance	59 to 61 Hz	49 to 51 Hz
Steady state current (typical)	16.4 A	8.6 A
Steady state current (maximum)	24.0 A	12.0 A
Power consumption (typical)	1710 W	1750 W
Power consumption (maximum)	3132 W	3216 W

Table 17: Electrical Requirements for MicroVAX and VAXstation II/GPX Systems in the H9642 Cabinet

	120 Vac	240 Vac
Voltage tolerance	90 to 128 Vac	184 to 256 Vac
Power source phasing	Single	Single
Frequency	60 Hz	50 Hz
Line frequency tolerance	59 to 61 Hz	49 to 51 Hz
Steady state current (typical)	16.4 A	8.6 A
Steady state current (maximum)	24.0 A	12.0 A
Power consumption (typical)	1722 W	1766 W
Power consumption (maximum)	3132 W	3216 W



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